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8 January 1982

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 128

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VICTORIA MINISTER CALLS FOR BETTER NUCLEAR DEFENSE

Melbourne THE AGE in English 20 Oct 81 p 3

[Article by Philip Chubb: "Dixon Says Nuclear Shelters Are Needed"]

[Text]

Victoria's Minister for Youth, Sport and Recreation, Mr Dixon, called last night for a dramatic increase in Government spending on civil defence against nuclear war.

He said: "Expenditure on nuclear fallout shelters and civil emergency strategy is an essential ticket to hope in the ghastly eventuality of nuclear war. Australia cannot afford to assume some special immunity not yet vouchsafed to other nations."

Mr Dixon, delivering the second E. C. Dax Memorial Lecture at Melbourne State College, said that Australia would be "a relatively good place to be in the event of nuclear war, given the alleged low chance of a direct hit here".

"But our populations would be as lambs to the slaughter against radioactive fallout drifts," he said.

Mr Dixon said that spending in Australia on civil defence strategies fell far behind other Western nations.

"Planning for fallout shelters, urban evacuation and population dispersal is in its absolute infancy," he said. "Australians have virtually no idea of possible actions to safeguard their lives in a nuclear disaster, and no government has moved to address that information shortfall."

Asked about this later, Mr Dixon said he had made his views known to the Victorian Government and that he had been "disappointed with the response".

Mr Dixon's address was entitled 'Belief Without Drugs'. He said that the fear of war and nuclear devastation "may be the greatest destroyer of belief in the future that we face".

"The pressures of possible unemployment, inflation, the threat of nuclear destruction, all impinge on the adolescent's confidence in his or her future," he said. "It is no surprise that many feel apprehension when they look ahead, and doubt that society will allow them the meaningful future their parents took almost for granted."

He said that everyone had access to personal "highs" without drugs. "Individuals, parents, legislators and practitioners have the responsibility to reinforce alternatives to medication — alternatives which build belief in self and the world's future," Mr Dixon said.

He argued for significant shifts in health spending in favor of preventative measures.

CSO: 5100/7507

AUSTRALIA

FRASER COMMENTS ON REAGAN 'LIMITED NUCLEAR WAR' REMARK

Sydney THE SYDNEY MORNING HERALD in English 22 Oct 81 p 13

[Text]

Western Europe probably could not defend itself for more than a few days if it relied on conventional weapons to repulse an attack by Warsaw Pact countries, the Prime Minister, Mr Fraser, said yesterday.

It was a sad fact that Warsaw Pact countries were substantially ahead of NATO countries in terms of numbers of divisions, guns and highly sophisticated personnel carriers.

Mr Fraser was replying in Parliament to the Leader of the Opposition, Mr Hayden, who had asked if Mr Fraser agreed with President Reagan, who said he could envisage a limited nuclear war in Europe without involving the super powers.

Mr Fraser said that for a long time the basic defence of Western Europe had rested upon the nuclear deterrent, or the willingness of NATO partners to use tactical nuclear weapons.

It was probably that if countries in Western Europe had to depend on conventional weapons alone, they could not defend themselves for more than a few days.

Mr Hayden later referred the Minister for Defence, Mr Killen, to Mr Killen's remarks on May 5 that he doubted there could be such a thing as a limited nuclear war.

He asked whether the Minister still held this view.

Mr Killen said he had drawn the House's attention to a speech by the former United States Secretary of State for Defence, Mr Brown.

"His discussed precisely this position and he asserted that he took the view that prospects for limited nuclear war were very remote," Mr Killen said.

"But he did not cancel out the possibility that one could occur."

CSO: 5100/7507

ADVISORY PANEL PLUGS REFORM OF LAWS ON NUCLEAR SECRECY

Melbourne THE AGE in English 23 Oct 81 pp 1, 4

[Article by Simon Balderstone]

[Text] CANBERRA. — The Federal Government's advisory committee on uranium yesterday called for the scrapping or changing of sections of Australia's nuclear legislation which restrict civil liberties or require secrecy.

The Uranium Advisory Council also recommended establishment of an independent authority to license and regulate all nuclear activities in Australia.

It said there was some doubt that the secrecy provisions of the Atomic Energy Act were compatible with freedom of information initiatives which the Government was undertaking.

"Public confidence in the nuclear industry will not be achieved while it continues to be surrounded by apparent secrecy," says the council's report on its review of the Atomic Energy Act and related legislation.

The council — set up in 1977 to advise the Minister for Trade and Resources on the export and use of Australian uranium — sent the Minister, Mr Anthony, its review in April.

Members of the 12-man council include Mr G Lynch, chairman of the National Energy Advisory Committee; the Reverend William Daniel (Professor of moral theology at the Jesuit Theological College in Melbourne); Mr Harry Butler, and Mr Wesley Lanhupuy, director of the Bureau of the Northern Land Council.

The chairman is Sir Laurence McIntyre a former senior Australian diplomat.

The UAC annual report for 1980-81 was tabled in Federal Parliament yesterday.

Cold war context

A spokesman for Mr Anthony said last night that the council's findings would be taken into account by the Government in its review of the acts. The Government would receive their submissions, and an inter-departmental committee had been considering the matter, the spokesman said.

The UAC said restrictions on civil liberties and the availability of infomation had been introduced in the context of a "cold war" period.

"However, such restrictions do not apply to operations concerning other minerals, and they appear inappropriate in the present context of a commercial uranium industry which is conducted for peaceful purposes within the ambit of the nuclear non-proliferation treaty," the UAC said.

The restrictions are on the right of free speech and expression of opposing views, limits on workers' rights to picket or strike over nuclear matters, curtailment of peaceful protests and limits on entering prohibited (mining or nuclear) areas.

The UAC said further criticism of the legislation package was the wide powers it gave police. It said it understood that the Law Reform Commission had recommended stringent procedures for searches without warrants and uniform controls over police entry, search and seizure.

The council suggested that the Government take these recommendations into account in bringing legislation dealing with uranium and the nuclear industry into line with other Commonwealth acts.

It said certain provisions of the act were inconsistent with normally accepted principles of common law and that it saw no need for their retention. Law Reform Commission recommendations in this area could provide the basis for changes needed.

The provisions at variance with normal traditions of common law allow for:

- The use of evidence of conduct and known character to establish that an accused acted with intent to prejudice the defence of the Commonwealth;
- The conviction of an accused, if 'it appears' that he or she acted with intent to prejudice the defence of the Commonwealth;
- The reversal of the normal onus of proof in that the accused must prove that he or she did not have malicious intent in cases where it was proved that the accused dealt with the restricted material in any of the ways described in other sections of the act.

The council said that excessive legislative restrictions and regulations surrounding the industry have had a significant effect on public confidence. It believed that if relevant legislation was revised with "legitimate public interests in mind, existing mistrust of the industry will be lessened."

"This can only be to the advantage of all concerned," it said.

The council also attacked the "unduly severe" penalties provided for in the Atomic Energy Act and related acts. It said the penalties should be revised in accordance with the Law Reform Commission recommendations that punishment should be in proportion to the gravity of the crime and consistent with sentencing imposed for comparable breaches of the law.

The council recommended that the secrecy provisions of the nulear legislation package shoudl be repealed, except in relation to information directly concerned with nuclear weapons, commercially sensitive information or information restricted by virtue of international agreements.

It found that there was some misinformation and a lack of information in relation to nuclear matters, and that this had to be rectified.

The council considered that people who wished to inform themselves about nuclear matters should be readily available and that interested individuals and access to basic data from which they may develop their own viewpoints and conclusions," it said.

The council said an independent regulatory body should be established, and shoudl consist of experts in relevant areas without vested interests. It should have its own Act of Parliament, to spell out its responsibilities and functions, and should report directly to the Prime Minister.

It said that as the Three Mile Island accident had shown, the public was "particularly sensitive about inadequate, inaccurate or misleading information in these areas". Every effort should be made to take those factors into account when the legislation was changed so that public confidence in the industry would not be diminished.

It said there was a need for contingency plans for each nuclear project, so that with a potentially serious accident, remedial action could be taken quickly, smoothly and effectively.

On defence aspects, the council said it did not, as a whole, accept that cessation of Australia's participation in nuclear activities would have any effect in reducing the risk of enemy attacks on installations.

He said drafting of legislation groups should have reasonable needed to cover Australia's obligations under the Nuclear Nonproliferation Treaty and other international agrements should be given high priority.

Provision for compensation for damage resulting from nuclear operations was needed, and enterprises engaged in the industry should not be absolved from liability for damage resulting from their actions. However, a mechanism for Commonwealth underwriting of claims should be devised.

The UAC report also reveals "operational problems" at the Mary Kathleen uranium mine in central Queensland.

The problems include seepage from settling ponds and water storage areas, runoff from areas which use mine water to control dust, and cattle which "wander freely" over tailing pond areas, due to inadequate fencing.

In a letter to Mr Anthony, on 19 August last year, Sir Laurence said lock-up security in the yellowcake storage area could be improved, and added that revelations in the Press that some yellowcake had been stolen made this point more relevant.

He said the operating company was trying to contain the seepage problem, but the council considered that the other problems "could and should be rectified".

The report also contains a letter, from the UAC alternate chairman, Mr Lynch, sent on 27 April to Mr Anthony, which ence of Nabarlek (uranium mine) in relation to a non-release of water contaminants" and says the council therefore believes that were used, the Koongarra uranium project could be expected to achieve similar environmental safety.

But the letter was sent seven weeks after a radioactive spill at Nabarlek (and seven weeks before the operating company admitted the accident), and the Federal Opposition last night attacked the UAC, saying its conclusion was absurd and placed grave doubts on its competence.

The Ranger uranium inquiry recommended that Koongarra not proceed because of the possibility of waterborne pollutants entering a nearby creek and damaging a wildlife sanctuary.

spokesman on environment and conservation, said last night it was obvious that the Nabarlek spills and cover-up by Queensland Mines supported the Ranger recommendation.

CSO: 5100/7507

DELAYS NOW COULD RUIN URANIUM DEVELOPMENT IN NORTH

Sydney THE SYDNEY MORNING HERALD in English 22 Oct 81 p 21

[Text]

CANBERRA. — Development of the Koongarra and Jabiluka uranium deposits may not proceed unless construction work could begin next March, the Northern Territory Minister for Mines, Mr Tuxworth, warned yesterday.

Mr Tuxworth said that if there were further delays, the world uranium market could soften and prevent the projects from ever proceeding.

Yesterday Mr Tuxworth visited Canberra to press the Federal Government to expedite negotiations with the Northern Land Council and Aboriginal tribal groups to allow development to proceed by early 1982.

The Federal Government has constitutional authority over the mining of uranium in the territory and also administers the Aboriginal Land Rights Act under which agreements are reached with the Aboriginal communities.

"We take the view, whether its misguided or not, that if our two projects can start construction work by March we would in effect have cornered the world market," Mr Tuxworth said.

But he acknowledged that chances of a go-ahead at Jabiluka and Koongarra were "fading fast" and said if he was an investor he would "think twice" about investing in a uranium project at this stage.

On Tuesday the Minister for Aboriginal Affairs, Senator Baume, told Parliament that negotiations with the Northern Land Council involved complex issues and that agreement was not likely for some time.

"I can give no guarantee as to when the necessary approvals will be made available to permit construction to commence at either Jabiluka or Koongarra," he said.

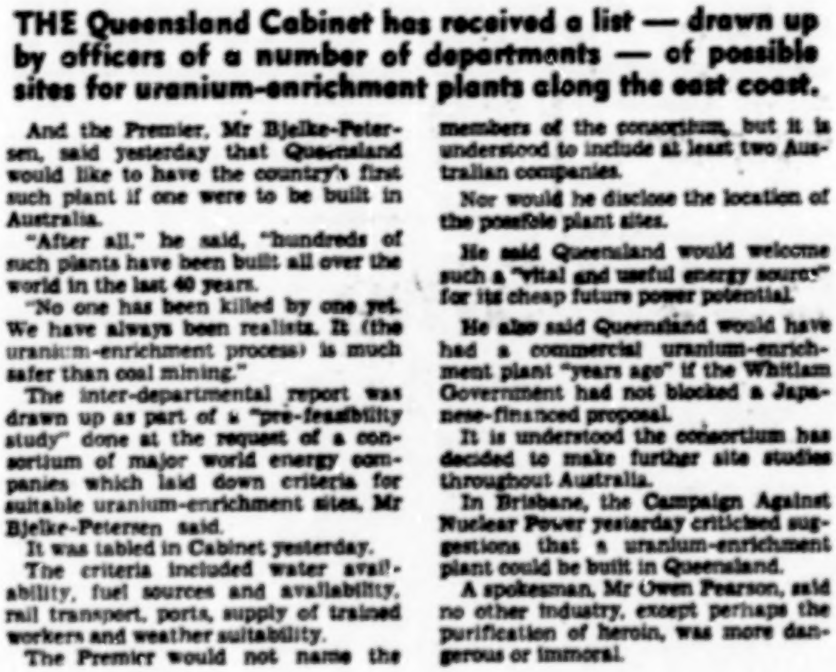
Mr Tuxworth also said yesterday that his Government would consider sending Ranger uranium out of Australia by air if necessary — adding an extra 70 cents a kilo to the cost of the yellowcake.

CSO: 5100/7507

QUEENSLAND CABINET REVIEWS URANIUM ENRICHMENT SITES

Brisbane THE COURIER-MAIL in English 27 Oct 81 p 2

[Text]



THE Queensland Cabinet has received a list — drawn up by officers of a number of departments — of possible sites for uranium-enrichment plants along the east coast.

And the Premier, Mr Bjelke-Petersen, said yesterday that Queensland would like to have the country's first such plant if one were to be built in Australia.

"After all," he said, "hundreds of such plants have been built all over the world in the last 40 years.

"No one has been killed by one yet. We have always been realists. It (the uranium-enrichment process) is much safer than coal mining."

The inter-departmental report was drawn up as part of a "pre-feasibility study" done at the request of a consortium of major world energy companies which laid down criteria for suitable uranium-enrichment sites, Mr Bjelke-Petersen said.

It was tabled in Cabinet yesterday.

The criteria included water availability, fuel sources and availability, rail transport, ports, supply of trained workers and weather suitability.

The Premier would not name the members of the consortium, but it is understood to include at least two Australian companies.

Nor would he disclose the location of the possible plant sites.

He said Queensland would welcome such a "vital and useful energy source" for its cheap future power potential.

He also said Queensland would have had a commercial uranium-enrichment plant "years ago" if the Whitlam Government had not blocked a Japanese-financed proposal.

It is understood the consortium has decided to make further site studies throughout Australia.

In Brisbane, the Campaign Against Nuclear Power yesterday criticised suggestions that a uranium-enrichment plant could be built in Queensland.

A spokesman, Mr Owen Pearson, said no other industry, except perhaps the purification of heroin, was more dangerous or immoral.

CSO: 5100/7508

AEC OFFICIAL SEES DUAL STANDARDS ON NUCLEAR, OTHER ENERGY

Perth THE WEST AUSTRALIAN in English 27 Oct 81 p 22

[Text] Dual standards of judgment were applied to the nuclear energy industry by the community, a leading Australian nuclear scientist said in Perth yesterday.

Dr C. J. Hardy, the chief nuclear fuel-cycle scientist of the Australian Atomic Energy Commission, said that the community accepted and quickly forgot accidents and deaths in the coal-mining industry, for instance.

But any incident in a nuclear power station or a uranium mine held the headlines for a long time and then stayed in the news for several years.

He cited the example of the Three Mile Island incident in the USA.

This was bred out of fear of the unknown, he said.

It could be overcome by education and proper presentation of the facts about topics such as nuclear energy and radiation.

RESENTED

This dual standard of judgment and microscopic examination was resented by the industry and his fellow scientists, he said.

Dr Hardy spoke last night to members of the Institution of Engineers and will address a public meeting at the WA Institute of Technology at 5.15pm today.

He said that the basic question involved the large-scale generation of electricity.

With fossil fuels becoming more expensive and, in the case of oil, less abundant, the search for alternatives was paramount.

Solar energy was not a practical option because the technology for a 1000-megawatt power station to supply a city was not yet available.

Nuclear energy had been developed over the past 20 years and reached a high level of sophistication and technology to generate cheap power.

The nuclear-energy industry and uranium mining had attained a high level of safety and had a better record than other activities, such as oil, coal and hydro power, Dr Hardy said.

WASTE

In the development of the industry, the disposal of the waste products was also arranged.

Underground burial in an insoluble form in geologically suitable locations was the best method.

The technology had been prepared and it was now a matter of selecting the best sites, he said.

The waste might have to be buried hundreds of metres below the surface. In France, it was being stored in blocks of glass till the burial site was chosen.

Dr Hardy said that Australia would not have to consider this matter until a decision had been made whether to build a nuclear power station.

The first commercial nuclear power station in Australia was unlikely before the mid 1990s, he said.

Australia was lucky because it had big reserves of coal suitable for power generation.

But Australian authorities, including WA's State Energy Commission, were already studying the options.

One of the advantages of nuclear power generation was that the waste could be captured and stored while the final disposal was decided.

"It is not possible to capture the ash and carbon-monixide gas emitted from coal-fired generation, for example," he said.

"Who can calculate the damage to the atmosphere or to the community from these emissions in 20 years time?"

CSO: 5100/7508

AGREEMENT OPENS WAY TO URANIUM MINING AT JABILUKA

Canberra THE AUSTRALIAN in English 28 Oct 81 p 1

[Article by Nicholas Rothwell]

[Text] AN agreement which will open the way to the mining of Australia's largest uranium deposit, at Jabiluka in the Northern Territory, has been drawn up between the local Aboriginal lands council and the holder of the prospecting lease, Pancontinental Mining.

The vast Jabiluka deposit, which contains 200 000 tonnes of uranium worth $11,000 million at today's prices, lies on the edge of the Kakadu National Park, which this week was listed as a World Heritage site by a United Nations commission.

The terms of the listing include strict environmental provisions which have cast doubt on a proposed uranium mine at the Koongarra site, surrounded by the park.

As a World Heritage site the park must also now be surrounded by a protected "buffer zone" encompassing all surrounding areas that influence the state of the site and the "way it is perceived".

Speaking in the Senate yesterday, the Minister for National Development and Energy, Senator Carrick, said the existence of the park did not preclude uranium mining, but promised no pollution would be allowed in the area.

Under the present five-year management plan for Kakadu, exploration and mining could proceed if the Government wanted, but there would be full protection of the environment.

The delays in Federal approval for mining at Koongarra were raised last week by the Northern Territory's Minister for Mines and Energy, Mr Tuxworth, when he briefed the parliamentary backbench committee on trade and resources in Canberra.

"Every time we see the light at the end of the tunnel as far as mining at Jabiluka and Koongarra is concerned, it seems to disappear," a spokesman for Mr Tuxworth said yesterday.

The new draft agreement to mine Jabiluka was completed before the park was listed, and has already been reviewed by local Aboriginal leaders.

The document, prepared by Pancontinental after an earlier draft had been amended by the Northern Lands Council, includes changes agreed to by the council.

Under its terms, Pancontinental offers to give money to the traditional owners of Jabiluka, an association of people from the area, Aboriginal councils in the area, Aboriginal lands councils and the Aboriginal Benefit Trust Account.

The company is offering more than $500 000 on consent to the agreement, another $1.4 million when construction of the mine begins and the same amount again for the first two years of mine building.

For the last year of construction, when production of uranium will begin, the company will pay $2.6 million, and for the following five years of production, another $1.3 million a year.

The draft agreement also includes a promise to give the local people any buildings left.

CSO: 3100/7508

GOVERNMENT APPROVES HONEYMOON URANIUM PROJECT IN SOUTH

Sydney THE SYDNEY MORNING HERALD in English 28 Oct 81 p 33

[Article by Patrick Walters]

[Text]

CANBERRA. — The Federal Government announced yesterday approval for the development of the Honeymoon uranium projec in South Australia.

The Honeymoon project, a joint venture between Mt Isa Mines, AAR Ltd (wholly owned by CSR) and Teton Australia, will see the first use in Australia of the in-situ leaching technique for the extraction of uranium.

Honeymoon, which is situated 75 kilometres northwest of Broken Hill, has total estimated reserves of 3,400 tonnes of uranium oxide. A pilot plant costing $6 million is expected to be completed next year with an annual output of 110 tonnes of uranium oxide. Commercial production could start in 1983.

The joint venturers have agreed to meet certain conditions to ensure the 75 per cent Australian equity rule will be met by the time commercial production begins.

The Uranium Advisory Council in its annual report tabled last week, was cautious in its environmental assessment of the project and advised additional monitoring of the site be carried out before the pilot stage started.

In a letter to the Minister for Trade and Resources, Mr Anthony, in June, the council felt the environmental impact of Honeymoon would fall within acceptable limits subject to certain conditions being met.

But the council told Mr Anthony its advice may need to be reviewed in the light of the evolution of the project.

Yesterday, Mr Anthony said Honeymoon's final environmental impact statement had been jointly assessed by the Commonwealth and South Australian Governments.

"Satisfactory environmental requirements have been established which, together with the requiremens of relevant State legislation, will enable controls to be implemented adequately over the project," Mr Anthony said.

CSO: 5100/7508

OPPOSITION OFFICIAL QUESTIONS WISDOM OF STATE CONTROLS

Brisbane THE COURIER-MAIL in English 29 Oct 81 p 14

[Text] Canberra--Australia's decision to give control of its uranium operation to the states and the Northern Territory would make it unique, Federal Parliament was told yesterday.

Introducing an urgency debate on hazards involved in the government's decision to hand over controls of both the uranium and nuclear industries, the Opposition environment and conservation spokesman, Mr West, said this would make Australia the only nation in the world to decentralise its nuclear controls to the states.

"If the government proceeds, Australia will be in the unique position of placing its obsession for small government before its responsibility for controlling this industry," he said.

The Labor Party opposed the development of the uranium and nuclear industries in Australia.

The world was facing a falling price for uranium. The Atomic Energy Commission had estimated the world demand to be 40,000 tonnes by 1988, but Australia's share would be lucky to be 8000 tonnes.

"Australia will by then be producing about 15,000 tonnes — almost double the amount we can expect to sell on the world market," Mr West said.

"I want to put it on record that the nuclear and uranium mining industries represent the most dangerous and complicated means of boiling water ever conceived by modern man."

Mr West said uranium mining legislation in Australia already was "shockingly complicated" with more than six major federal and state Acts involved.

The hazards would increase if controls were given to the states, which he said could not be trusted to act in the national interest.

Mr West said the Labor Party supported the inclusion of Kakadu National Park on the world heritage list, but the boundaries of the park had been twisted to allow uranium mining.

The Home Affairs and Environment Minister, Mr Wilson, said it was appropriate in a federal system to have co-operative approaches to uranium issues.

He said this would ensure high and acceptable standards were implemented throughout Australia.

The decision to give the states control of the nuclear industry would not diminish Commonwealth control.

Mr Wilson said the proposed code of practice for the mining and milling of uranium would be ready soon to be released for public comment.

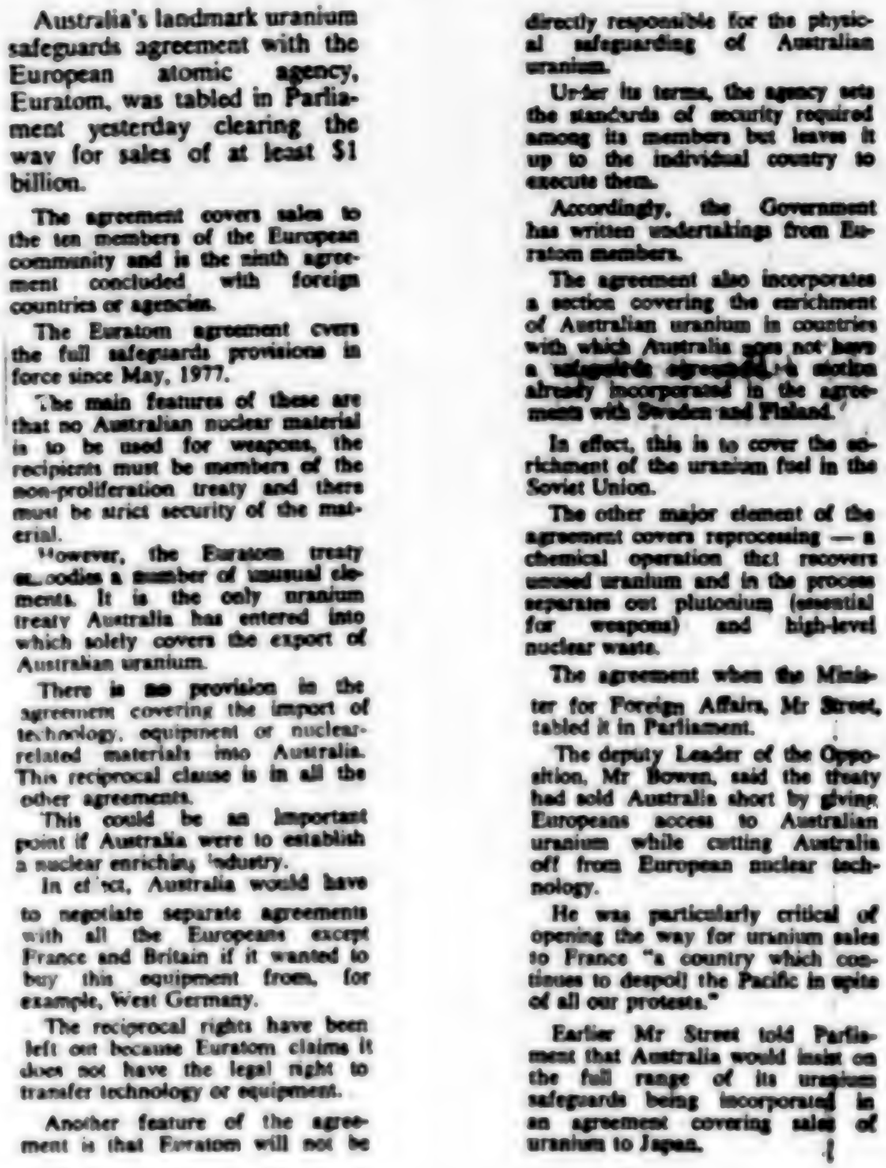
CSO: 5100/7508

PACT WITH EURATOM WILL OPEN WAY TO URANIUM SALES

Sydney THE SYDNEY MORNING HERALD in English 29 Oct 81 p 12

[Article by Scott Milson: "Treaty Clears Way for Uranium Sales"]

[Text]



Australia's landmark uranium safeguards agreement with the European atomic agency, Euratom, was tabled in Parliament yesterday clearing the wav for sales of at least $1 billion.

The agreement covers sales to the ten members of the European community and is the ninth agreement concluded with foreign countries or agencies.

The Euratom agreement cvers the full safeguards provisions in force since May, 1977.

The main features of these are that no Australian nuclear material is to be used for weapons, the recipients must be members of the non-proliferation treaty and there must be strict security of the material.

However, the Euratom treaty embodies a number of unusual elements. It is the only uranium treaty Australia has entered into which solely covers the export of Australian uranium.

There is no provision in the agreement covering the import of technology, equipment or nuclear-related materials into Australia. This reciprocal clause is in all the other agreements.

This could be an important point if Australia were to establish a nuclear enriching industry.

In effect, Australia would have to negotiate separate agreements with all the Europeans except France and Britain if it wanted to buy this equipment from, for example, West Germany.

The reciprocal rights have been left out because Euratom claims it does not have the legal right to transfer technology or equipment.

Another feature of the agreement is that Euratom will not be directly responsible for the physical safeguarding of Australian uranium.

Under its terms, the agency sets the standards of security required among its members but leaves it up to the individual country to execute them.

Accordingly, the Government has written undertakings from Euratom members.

The agreement also incorporates a section covering the enrichment of Australian uranium in countries with which Australia does not have a safeguards agreement — a section already incorporated in the agreements with Sweden and Finland.

In effect, this is to cover the enrichment of the uranium fuel in the Soviet Union.

The other major element of the agreement covers reprocessing — a chemical operation that recovers unused uranium and in the process separates out plutonium (essential for weapons) and high-level nuclear waste.

The agreement when the Minister for Foreign Affairs, Mr Street, tabled it in Parliament.

The deputy Leader of the Opposition, Mr Bowen, said the treaty had sold Australia short by giving Europeans access to Australian uranium while cutting Australia off from European nuclear technology.

He was particularly critical of opening the way for uranium sales to France "a country which continues to despoil the Pacific in spite of all our protests."

Earlier Mr Street told Parliament that Australia would insist on the full range of its uranium safeguards being incorporated in an agreement covering sales of uranium to Japan.

CSO: 5100/7508

AUSTRALIA

BRIEFS

WARNING ON FRENCH WEAPONS--Canberra--Australia's proposed uranium sales to France could help the French build nuclear weapons which might be tested in the Pacific, the Opposition Deputy Leader, Mr Bowen, said yesterday. He said the Fraser Government was "hypocritical" on the question of safeguards for uranium sales and it was "nonsensical" to suggest that Australia could trace its uranium after it had been sold in Europe. He had been told that the French Government would go ahead with nuclear tests in the Pacific. "They could well be using our uranium, or they could have the facility to use other uranium because we supply ours," Mr Bowen said. He spoke in Parliament during debate on a statement by the Foreign Minister, Mr Street, on the nuclear safeguards agreement Australia has signed with the European Atomic Energy Community. [Text] [Sydney THE SYDNEY MORNING HERALD in English 29 Oct 81 p 12]

MARY KATHLEEN PRODUCTION--Sydney--Mary Kathleen Uranium Ltd said in its September quarterly report that uranium shipments had been halted since June as a result of action by the Seamen's Union of Australia, although production was continuing. Uranium oxide production in the latest quarter was 196.5 tonnes, down from 224.9 tonnes in the previous quarter and 170.2 tonnes in the first quarter of 1981. Production for the nine months to September 30 was 591.6 tonnes, down from 614.2 tonnes in the previous corresponding period. An application has been made to the Federal Court for an order restraining the Seamen's Union from preventing the shipment of the company's product. Expenditure during the quarter on exploration outside the immediate environs of the Mary Kathleen orebody was $178,650 and exploration expenditure within the Mary Kathleen mining lease $145,841. No mineralisation of economic signifcance has been found. [Text] [Brisbane THE COURIER-MAIL in English 31 Oct 81 p 28]

DARWIN YELLOWCAKE SHIPMENT HALTED--Darwin--Another confrontation on a shipment of yellowcake has flared on the Darwin waterfront. It follows an attempt by Energy Resources of Australia to load a consignment of 12 containers from the wharves. A picket has been mounted on the approach to the main wharf and a union spokesman said the wharf was idle and would remain idle until the yellowcake was removed. The spokesman said the yellowcake was moved to a holding yard near the wharf early yesterday morning and was now on the trucks which carried it. A company representative approached the Waterside Workers' Federation yesterday and asked them to handle it. They refused, walked off the job and mounted the picket. The yellowcake is the first to be consigned from the Ranger project, 250km east of Darwin. There was another confrontation earlier this year when Queensland Mines shipped yellowcake from Darwin on a barge from private waterfront land. It is understood the latest consignment is due to be loaded on a small freighter, the Pacific Sky, now at the wharf. [Text] [Brisbane THE COURIER-MAIL in English 17 Oct 81 p 3]

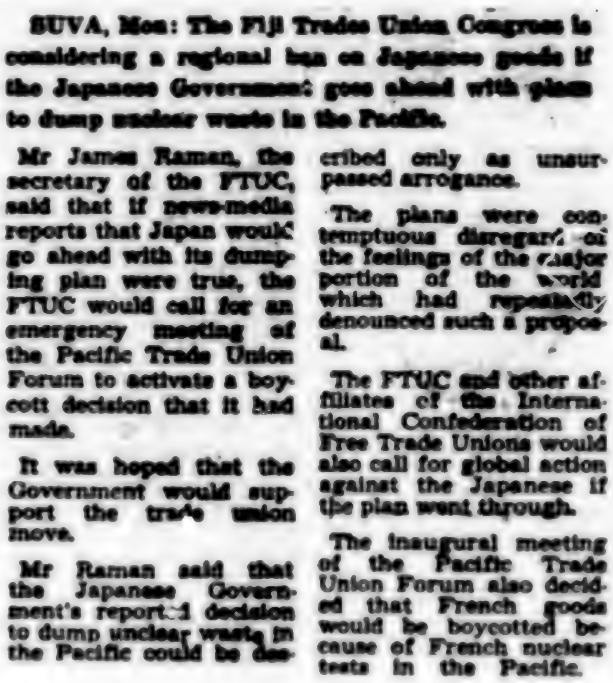
CSO: 5100/7507

FIJI

FIJI REACTS TO JAPANESE NUCLEAR WASTE DUMP PLANS

Perth THE WEST AUSTRALIAN in English 3 Nov 81 p 47

[Text]



SUVA, Mon: The Fiji Trades Union Congress is considering a regional ban on Japanese goods if the Japanese Government goes ahead with plans to dump nuclear waste in the Pacific.

Mr James Raman, the secretary of the FTUC, said that if news-media reports that Japan would go ahead with its dumping plan were true, the FTUC would call for an emergency meeting of the Pacific Trade Union Forum to activate a boycott decision that it had made.

It was hoped that the Government would support the trade union move.

Mr Raman said that the Japanese Government's reported decision to dump unclear waste in the Pacific could be described only as unsurpassed arrogance.

The plans were contemptuous disregard of the feelings of the major portion of the world which had repeatedly denounced such a proposal.

The FTUC and other affiliates of the International Confederation of Free Trade Unions would also call for global action against the Japanese if the plan went through.

The inaugural meeting of the Pacific Trade Union Forum also decided that French goods would be boycotted because of French nuclear tests in the Pacific.

CSO: 5100/4512

BRIEFS

NUCLEAR POWER UNITS--Bombay, November 11--The department of atomic energy is currently engaged in the design of 500 Mw nuclear power units and many of the components for the Narora atomic power station are designed in such a way that they would facilitate easy transition from 235 Mw to 500 Mw units. This was stated by the chairman of the Atomic Energy Commission, Dr H. N. Sethna, at the International Scientific Forum on Changes in Energy, currently in session in Mexico. Dr Sethna is one of the invited speakers at the conference. A copy of his speech was made available to the press here today. Dr Sethna expressed his confidence in the ability of Indian industry in tackling the new technological problems which might be faced in the construction of 10 more units of 235 Mw each of the Narora type. He hoped that the construction period of these stations would be reduced progressively. Offering India's cooperation in sharing her experience in this field with other developing countries, Dr Sethna said: "We are equally anxious to learn from the experience of other developing countries." [Text] [Bombay THE TIMES OF INDIA in English 12 Nov 81 p 6]

CSO: 5100/7021

SCHWANDORF REPROCESSING PLANT TO BE BUILT IN 1985

Hamburg DIE ZEIT in German 20 Nov 81 p 22

[Article by Hermann Boessenecker: "A Gorleben in Bavaria"]

[Text] For Hans Schuierer, district administrator of Schwandorf in the Upper Palatinate, one thing is certain: "There is no end of trouble ahead." This prophecy is fulfilling itself.

In eastern Bavaria, a quarrel has been raging for 3 weeks now concerning a 10-billion-mark project which could help this structurally weak region to achieve an unprecedented economic expansion, but which is frightening many citizens: A reprocessing plant for spent fuel assemblies from nuclear power plants. Minister President Franz Josef Strauss is optimistic: He believes that "once the barriers of superstition are overcome, a race to the plant will then commence."

Events had moved quickly: As recently as on 27 October, the Bavarian minister for regional development and environmental concerns, Alfred Dick, had proposed "criteria on the evaluation of sites" for such a plant, and thereupon had named 11 possible localities. But by order of Strauss, the names of these sites were not published. The list was handed over only to the fraction chairmen in the state legislature. In reality, this was a farce. Because, according to opposition leader Helmut Rothemund, "to Dick it was clear that they would end up with Schwandorf."

From the very beginning, all informed persons considered one particular site to be favored: The area east of Schwandorf in the immediate neighborhood of the mines of the Bavarian Brown-coal Industry (BBI) in Wackersdorf. These mines will have to close down in the fall of next year because the coal will have been completely exhausted. At present more than 700 people are still employed there, and these will be threatened with unemployment at that time.

The parent company of this brown-coal mining outfit, Bayernwerk AG of Munich, most of whose capital is tied up in the free state of Bavaria, has at its disposal in this region so much land in reserve that the area requirement of 200 to 240 hectares for a reprocessing plant can be satisfied to a large extent. To supplement this, one has recourse as well to the adjacent national forest.

At the German Company for Nuclear Fuel Reprocessing mbH (DWK) in Hannover, it was realized that it would be senseless and harmful to continue playing this little game about the site. In order to preserve credibility at the outset, it "got rid of the hot air": By 30 October already, the DWK had made known that for it as the construction sponsor, the area east of Schwandorf seemed to be "generally suited" for the site "from an industrial point of view and on the basis of previously gained experiences in the search for sites in other Federal Laender" (Lower Saxony, Hesse, and Rhineland-Palatinate). Therefore this area will be "studied on a priority basis."

If the result of this is positive, and almost nobody doubts that it will be, then at the beginning of next year a petition could be filed for a land-use planning procedure (with a duration of 2 years). This would be followed by licensing procedures involving nuclear-power, water-use, construction, and environmental laws, and if everything goes according to plan and the protests of the nuclear-power opponents do not upset the applecart, then according to the timetable of the optimists one could expect the initial partial construction permit as early as in 1985.

Beginning of Operations in 1995?

Given a construction time of 8 to 10 years, portions of the complex such as the receiving store for fuel elements could go into operation by 1992 already, and the complete plant could begin to operate in 1995.

The environmental ministry was quick to set up an informational and guidance service in the Schwandorf district administrator's offices. In the future, two qualified experts are supposed to field questions from interested and concerned citizens each Friday afternoon. Just this week, even the DWK became active in Schwandorf. As public relations officer Detlef Marquardt announced, it intends to "have a crew on the spot."

But the opponents of this gigantic project have reacted even more quickly and are sounding the rallying signal. Although there are definitely positive voices on the part of some mayors of neighboring villages and from unionists, nevertheless at least in the headlines of the local papers the opposition is making a far louder noise.

For example, a majority of the Schwandorf SPD voted against this project because it does not see "any sound reason" for such a plant, and even the local CSU initially reacted negatively, because it fears "a mess such as happened in Brokdorf and Gorleben"--something which in turn Bavaria's SPD leader Rothemund cannot believe.

In the region concerned, there is a particularly strong feeling of annoyance with the argument that what is desired is to produce an "effect on employment" here, where soon about 2,000 jobs will be lost at the brown-coal outfit, in the Schwandorf branch factory of Triumph-Adler, and at Maxhuette in neighboring Haidhof: Someday the reprocessing plant is supposed to employ about 2,300 people, of which 80 percent will be skilled and semiskilled workers from the vicinity. FDP circles immediately complained about this "business" of the "reduction of unemployment as a risk premium for the reprocessing plant." A newly formed citizens' initiative accused the Government: "The plight of the unemployed and the previous good conduct of the population seem to be the most important criteria in the search for a site." It said that now there is proof "that this site had been planned long in advance."

A drastic expression of the mood in the Upper Palatinate district is the wicked banner line: "The bacon to Munich, the dirt to Schwandorf." And the kreis chairman of the "green" list ventured so far as to make the assertion that the only thing "certain" about the reprocessing plant was "the death of the people working there." What good is it then that Dick's state secretary, Max Fischer, rejects this "painting of terrible apocalyptic pictures" and speaks of "irresponsible scaremongering"?

The Munich planning strategists refer to the negligible potential for danger with this nuclear plant, to the reliable processing technology involved, to the fact that ten such plants are in operation already worldwide, and to the fact that at least five more are projected. It is also by no means the case that the Bavarian structural-policy experts have placed their hopes solely on reprocessing. For years now, economics minister Anton Jaumann has been striving mightily to attract outfits willing to locate in this area, with some measure of success.

In any case, Michael Wildegans, employee's representative with the brown-coal works, would prefer to "view less dramatically" the situation of his wards: After severance payments to the older employees, at most only 380 jobless persons would be left, and moreover 200 of these have been offered a job within the Bayernwerk sphere--"but mobility is zero here." According to Wildegans' circumspect formulation, "temporary unemployment is not necessarily felt as a threat" by most of these workers, and thus "among the employees there is also no unrest." He says that although in Schwandorf today, with an unemployment rate of 8.6 percent, there are already about 10,400 unemployed people, still "we are not getting any skilled workers."

SPD chairman Rothemund also warns that "this reprocessing plant does not solve the acute labor-market problems. The people must sense that their rulers truly feel responsible for this region--they must be convinced that they are not being fed with hopes of a still-distant large-scale technology." The head of the Bavarian social democrats is prepared to support land-use planning proceedings for the processing plant if a debate on it should develop in the state legislature: "Then I will stand up and say that we should go through with these proceedings."

Plant of 700 Tons Considered

But this promise by no means signifies that Rothemund has already taken a stand also on the question of reprocessing itself: "Here I will say neither yes nor no until the report by Bonn's second Energy Inquiry Commission has been submitted." But if by 1985 the commission has decided in the affirmative in the matter of nuclear energy, this means that the necessary conditions for the construction of the plant must have been provided already. Moreover, Rothemund naturally cannot afford to refuse to back his fellow party member Holger Boerner in Hesse.

In Hesse, so far only a single 350-ton plant for reprocessing is at issue--and likewise in Rhineland-Palatinate and Lower Saxony. Following the political failure of the integrated waste-disposal concept (including an ultimate storage facility) in Gorleben, there had been thorough deliberations in Hesse above all concerning a Land-type solution, in view of the Biblis large power plant. In those days, according to DWK's spokesman Marquardt, murdered economics minister Heinz Herbert Karry had started with an "assumed number" for a reprocessing plant: That of 350 tons.

In Bavaria as well, 350 tons were aimed at initially. But Dick's "site criteria" already assumed an annual capacity of 700 tons of heavy metal. Rothemund: "That surprised me very much." A considerably greater efficiency is achieved thereby (the original Gorleben design had been for 1,400 tons). Experts figure that compared to two plants each half as large, approximately 30 percent of the capital costs can be saved, even if--as planned--the DWK decides in favor of two parallel tracks of 350 tons each. It is certain that in any case, costs will not remain at the 6 to 8 billion marks estimated on the basis of the present value of money.

Minister Dick would like proper appreciation to be given to the courage of the Bavarian government, in that "to the disappointment of its political adversary" it had not waited until after the state-legislature elections in the autumn of next year before giving its essential consent to the reprocessing plan. He says that Bavaria, being a "lowland state," could not shirk its responsibility.

The construction of an external intermediate storage facility is rejected by Dick, because it would "only postpone the problems"--and because reprocessing represents the economically and ecologically better solution. And Bavaria is opposed to an intermediate storage facility also "so as to keep the pressure on Bonn to build an ultimate storage facility as rapidly as possible" (Dick). But the salt domes in the northern lowlands of Germany, he says, are best suited for an ultimate storage facility. With that, the buck is passed on to the federal government.

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CSO: 5100/2042

OPPOSITION MOUNTS TO URANIUM MINING IN SOUTHWEST

Hamburg DER SPIEGEL in German 30 Nov 81 pp 48,50

> [Text] Europe's richest uranium deposits lie in southwestern Germany. Mining operations will damage the landscape and the environment; the citizenry is girding for a protest.

Stuttgart Economics Minister Rudolf Eberle concedes the facts of the case only casually and in a very offhanded manner: "Baden-Wuerttemberg has substantial uranium deposits in its own Land." Then, however, he immediately adds the calming note that these mineral resources, a costly fuel for nuclear power plants, are "not to be mined, but will remain where they are for emergencies."

This can change suddenly, for the new Federal Mining Law goes into effect on 1 January 1982. And it covers all existing rights pertaining to mining laws, regulates future prospecting probes or mining requests and supersedes the former regional jurisdiction over subterranean activities.

Then the whole country will take notice of something which politicians in southwestern Germany have preferred to keep under wraps out of concern over civil unrest, something which has been noted by technical journals at most: The uranium deposits previously known to exist under Baden soil are among the largest in size and richest in ore content in all Europe.

A reply by the Baden-Wuerttemberg Economics Ministry to an inquiry from the group of "Greens" in the Stuttgart Landtag revealed the scope of the underground activity:

Three companies are prospecting for uranium in nine franchise territories in southwestern Germany. They are the "Brunhilde Mining Company" (Uetze/Hannover), the "Saarberg-Interplan GmbH" [limited liability company] (Saarbruecken) and the "Uranerzbergbau [uranium ore mining] GmbH" (Bonn);

A deposit that has already been mined on a trial basis near Menzenschwand in Waldshut is considered the largest vein with the highest content of uranium ore; the second-largest deposit was found close to Baden-Baden;

The most promising uranium territory covers an area of about 3,300 square kilometers extending over five rural districts in southern Baden and southern Wuerttemberg;

the region is being scanned using an airborne procedure — radiation readings taken from aircraft.

Although the FRG is already obligated under the Euratom Treaty to explore possible uranium deposits "to the point of total development," Bonn has had little interest in distinguishing itself with a partial independence from foreign uranium imports as long as nuclear fuel for German nuclear power plants can easily be obtained from places like the United States and Canada, Australia, Brazil and South Africa.

But worldwide limits appear to have been set to the exploitation of uranium. A study by the OECD in Paris estimates the uranium reserves of noncommunist regions to be about 2.56 million tons. Depending on the increase in the number of nuclear power plants throughout the world, says the OECD analysis, uranium supply bottlenecks could develop at some time in the future. So it may already seem advisable to supporters of nuclear power to start searching out national reserves. The only problem is that three potential prospecting centers are located in beautiful tourist and recreational areas —Menzenschwand in the Black Forest, near the idyllic abbey town of St Blasien, and Muellenbach, a suburb of the elegant resort city of Baden-Baden; in third place on the list — also according to expected yield — is the source region at Maehring in Bavaria.

Uranium mining is virtually out of the question without damage to nature and the environment. In Baden-Wuerttemberg, at any rate, Greens, environmental protection organizations and community bodies are girding themselves for a defense against future dangers — disfigurement of the landscape by uranium mines and permanent damage caused by direct radioactivity from the exposed rock.

The search for uranium had hitherto been pursued without major conflicts. Baden-Wuerttemberg supported the operations to the tune of DM 1.4 million; a study by the Karlsruhe Nuclear Research Center termed the added radiation exposure for the population in and around Menzenschwand "negligible."

There was audible protest only after CDU Economics Minister Eberle noted that the uranium deposits in the Black Forest might some day become "mineral springs for rheumatics," like the radon galleries at Badgastein. The Federation of Citizens Supporting Environmental Protection (BBU) called Eberle's "witty asides" a case of "dangerous horse-trading" after an "Environmental Protection Tutorium" at Heidelberg University had measured critical amounts of radioactive rays in the uranium gallery near Baden-Baden. The BBU asked this question: "Would the minister rather have citizens with lung cancer than rheumatics?"

Several other companies that had been searching for uranium ore in recent years turned in their franchises for the Neckar Valley and the Nagold Defile to the state of Baden-Wuerttemberg because it seemed to them that the long permit process, the legal risks and the hindrances to be expected from the public were too much trouble.

The Brunhilde Mining Company has been searching for uranium at Menzenschwand for the last 20 years. The bottom of one borehole at the Krunkelbach uranium mine is already at a depth of 120 meters; a test site is 780 meters long. So far — only in the experimental stage — the yield has nevertheless amounted to 8,000 tons of uranium ore with an optimum uranium content of between 0.7 and 1.0 percent. A company in the Palatinate is processing the uranium ore obtained from the test drillings into fuel rods for nuclear power plants.

The deeper the Brunhilde drillers went, the thicker and richer the deposit proved to be; it is already calculated to be close to 5,000 tons of pure uranium; it would be enough to supply two large nuclear power plants for 20 years.

Other, even heavier, deposits are suspected in a mass of rock that has not yet been tapped.

To be able to investigate the total volume of uranium in a way that would even halfway cover costs, the private company is pushing for permission for a limited mining operation, but the state of Baden-Wuerttemberg does not want to grant it. The intention is to avoid setting a precedent that could bring violent opposition from the public.

The Brunhilde Company now has an ally in the form of the SPD group in the Landtag; the group's working committees on finances and the economy recently visited the site to gather on-the-spot information. Although the party comrades oppose additional nuclear power plants such as Neckarswestheim II or Wyhl, they do want to help the Brunhilde fuel source because of jobs.

"I'm surprised," says Claus Wyrosta, deputy chairman of the SPD group in the Landtag and a confirmed opponent of nuclear power plants, "that the government has left Menzenschwand in limbo for so long" — his opinion is that a restricted mining permit would allow the mine to survive without the necessity of exploiting it immediately on a grand scale.

It is suspected that there are more than 3,200 tons of uranium-bearing rock near Baden-Baden — and far greater amounts in an area that has not yet been scanned. But all preliminary work has been halted for the time being.

In 1979, the city of Baden-Baden had surprisingly canceled the "permission contracts" with Saarberg-Interplan even though the prospecting work had begun long before; nearly 100,000 meters had already been drilled. The main reason offered by the resort city fathers: Nature and tourism were being threatened with great harm.

The BADISCHE NEUESTE NACHRICHTEN in nearby Karlsruhe commented as follows on the defensive reaction: "The term uranium, having little value as a drawing card, is to be kept out of the 'city with class.'"

After Saarberg-Interplan's business manager Hans Juergen Ertle had repeatedly knocked on doors seeking renewal of the contracts and had attested to "losses in the millions," the Land Mining Office in Freiburg ordered "compulsory admission" for the company in September of this year. Under paragraph 10 of Baden's still valid Land Mining Law, the city of Baden-Baden was supposed to release to Saarberg-Interplan the terrain for six test boreholes for uranium and one radon measuring program.

All the authorities consulted beforehand had declared that no danger to the Baden-Baden mineral springs was to be anticipated, that no disadvantages for resort operations could be perceived and that the drilling sites would be recultivated. Said

Klaus Hast, director of the Land Mining Office: "We consider it out of the question that uranium prospecting will harm the tourist trade or even cut down on the number of beds."

The city government appealed the compulsory admission, but the appeal was disallowed by the Economics Ministry in Stuttgart, which had jurisdiction. Now the city is taking its case to the Administrative Court in Karlsruhe; Mayor Joerg Zwosta offers this assurance: "We're going to resist to the bitter end."

To be sure, the forthcoming Federal Mining Law grants the prospecting companies a legal right to the mining of minerals insofar as there are no "overwhelmingly conclusive public arguments" against it — both the Brunhilde Mining Company and Saarberg-Interplan are confident.

The extent of the interest being accorded German uranium prospects is shown by the circumstance that an American company and a British company have secretly become partners in prospecting ventures in Baden-Wuerttemberg. The Pathfinder Mines Corporation in San Francisco, a uranium mining company that belongs to the General Electric Corporation, has owned a 75-percent interest in three of the Brunhilde Mining Company's prospecting franchises since 1977.

And the Rio Holdings Exploration GmbH of Hannover, a subsidiary of the British Rio Tinto Zinc Corporation Ltd, has been in on the Black Forest scheme since last year; it owns 40 percent of two of Saarberg-Interplan's franchises. Says Minister Eberle: "The franchises apply only to the search."

7458
CSO: 5100/2048

BRIEFS

NUCLEAR DOCUMENTS DISAPPEARANCE--The DST [Internal Security Service] has begun an investigation at several nuclear power plants and research centers to determine if their classified documents are being properly safeguarded. The investigation follows the recent disappearance of several folders of documents from the Tricastin facility at Pierrelatte. [Text] [Paris LE POINT in French 14 Dec 81 p 41]

CSO: 5100/2065

SURVEY INDICATES SOFT STUDENT SUPPORT FOR NUCLEAR ENERGY

Madrid ENERGIA NUCLEAR in Spanish May-Jun 81 pp 207-217

[Article by Jose M. Martinez-Val, Chair of Nuclear Technology, ETS Industrial Engineers, Madrid Polytechnical University: "University Opinion on Nuclear Energy"]

[Excerpt] 3. Results of Public Opinion Survey in Madrid Universities

The idea of conducting a survey on nuclear energy in the university community is certainly old but the job has really never been done the way it should be. This may be justified by the by no means negligible complexity involved in carrying out such a survey fundamentally due to the need for interviewers.

Financing surveys is always a delicate matter and there are those who say that it suffices to know who pays for the job to figure out what you are going to get in the end. In our case, the problem so to speak solved itself thanks to the volunteer students in the last courses in the "energy techniques" specialty at the Madrid ETS [Engineering College] for Industrial Engineers.

Originally, the results of this survey were submitted to the Sixth Annual Meeting of the Spanish Nuclear Society, consisting of the first 500 responses obtained; that was equivalent to an error of ±4.5 percent with a degree of confidence of 95 percent in cases where abstentions were irrelevant. These results produced varied and extensive comments in the various sectors of the Spanish nuclear community which to a certain extent provided material for this article since impossible interpretations are as important as the cold statistics.

3.1. Short Survey History

The survey was conducted throughout 1980 (with the exception of December). This must be pointed out from the very beginning because everybody knows that public opinion keeps changing as a result of big events and those which are not so big are magnified by the media. We are trying to say here that, if another Harrisburg had occurred in 1981, perhaps the results would no longer have any meaning.

As happens very often, the response to a certain question depends on how it is formulated; we prepared a form in advance (see Table I) with the intention of obtaining certain experiences that would help us in spelling out our ultimate goals.

Among the 30 questions in the preliminary form, there were some intended to reveal the level of nuclear information among university students. They were, for example, questions No 7, 9, 10, and 24. They caused extraordinary irritation among the interview subjects, according to the investigators; this irritation is logical if we keep in mind that the above-mentioned information level was very low. Most of the questions remained unanswered. Less than 2 percent knew the meaning of the abbreviation TMI-2.

On the other hand, 30 questions were just too many to answer and only 15 were picked from among them for the final questionnaire, shown in Table II, together with the results of the first 500 sheets turned in with answers.

Table I. Preliminary Form

Madrid ETSI for Industrial Engineers

Survey on Nuclear Energy

To determine the level of information and public opinion on nuclear energy, would you be kind enough to answer these questions, circling your choice?

1. Would you live less than 30 kilometers from a nuclear power plant? Yes--No.

2. Do you believe that a referendum is in order to decide whether more nuclear power plants should be built? Yes--No.

3. Would it be a good idea for nuclear power plants to be nationalized? Yes--No.

4. Do you believe that fear of nuclear arms proliferation is an obstacle to the development of civilian nuclear energy? Yes--No.

5. If you were to live near a nuclear power plant and if reliable news were to be announced to the effect that there has been a radioactive leak, would you immediately try to find out what the weather conditions in the area are? Yes--No.

6. Do you believe that the risks connected with the operation of a nuclear power plant can be so reduced that they would be negligible compared to those connected with other human activities, such as, for example, riding in a car? Yes--No.

7. Do you know the difference between nuclear fission and fusion? Yes--No.

8. Do you believe that investigations on nuclear fusion should be promoted? Yes--No.

9. How many nuclear power plants were in operation in Spain in 1979? 1, 2, 3, 4, 5, 6, 7.

10. In Siberia there are more nuclear reactors than in the European part of the USSR. Yes or no? Yes--No.

11. Do you know the name of any nuclear power plant (anywhere in the world) which works with a fast [breeder] reactor? Please write it down.

12. Do you believe that a nuclear submarine is more dangerous than a civilian nuclear power plant? Yes--No.

13. Do you believe that natural radioactivity is more innocuous than artificial radioactivity, at equal dose? Yes--No.

14. Can a reactor in a nuclear power plant explode like an atomic bomb? Yes--No.

15. Would you agree to have equivalences established between the effects of radioactivity and those of tobacco, for example?

16. Do you know the meaning of the abbreviation TMI-2? Please write it down.

17. Do you believe that opposition to nuclear power plants would decline if, in addition to importing them from the United States, we were to import them also from the USSR? Yes--No.

18. Do you believe that the people living around a nuclear power plant within a radius of 30 kilometers should receive economic compensation for this circumstance? Yes--No.

19. Do you believe that the inhabitants in a river basin with a big dam at its headwaters should get economic compensation because of that? Yes--No.

20. Do you believe that the vast French nuclear development plan is basically due to excessive fear of OPEC actions? Yes--No.

21. Do you believe that too much is being improvised in Spain in the matter of energy? Yes--No.

22. Do you think it proper for the government to be both a judge and a party in applications for peaceful uses of nuclear energy? Yes--No.

23. Do you believe that nuclear power plants were built in the world at less than 20 kilometers from major population centers, including national capitals? Yes--No.

24. Do you believe that a "light-water" nuclear reactor can work with natural uranium? Yes--No.

25. Do you believe that you are sufficiently informed on nuclear energy? Yes--No.

26. Do you think that the press is treating nuclear energy subjects with too much sensationalism? Yes--No.

27. Do you believe that information on nuclear matters appearing in the media requires more scientific rigor? Yes--No.

28. Do you know in what year a nuclear reactor built by man worked for the first time? Please write it down.

29. Do you believe that nuclear energy is indispensable for humanity's progress? Yes--No.

30. If there were a referendum in Spain on the construction of new nuclear power plants, how would you vote? Yes--No.

Please indicate your career field and your college major. Thank you.

Table II. Results of survey (in Percent) (December 1980)

Madrid ETSI for Industrial Engineers

Nuclear Energy Survey		Results	
	Yes	No	Don't Know
To determine the level of information and public opinion on nuclear energy, would you be kind enough to answer these questions, circling your choice?			
1. Would live less than 30 kilometers from a nuclear power plant? Yes--No.	35.6	62.0	2.4
2. Do you believe that a referendum is in order to decide whether more nuclear power plants should be built? Yes--No.	63.6	35.4	1.0
3. Would it be a good idea for nuclear power plants to be nationalized? Yes--No.	74.8	19.2	6.0
4. Do you believe that the risks connected with the operation of a nuclear power plant can be reduced so much that they would be negligible compared to those deriving from other human activities, such as, for example, riding in a car? Yes--No.	52.2	44.8	3.0
5. Could a reactor in a nuclear power plant explode like an atomic bomb? Yes--No.	25.0	60.6	14.4
6. Do you agree that equivalences should be established between the effects of radioactivity and those of tobacco, for example? Yes--No.	25.2	66.6	8.2
7. Do you know the meaning of TMI-2? Please write it down	1.8	uncertain	
8. Do you believe that people living around a nuclear power plant within a radius of 30 kilometers should get economic compensation because of that? Yes--No.	32.6	61.8	5.6

9. Do you believe that the inhabitants in a river basin with a big dam at its headwaters should also get economic compensation because of that? Yes--No.	24.2	71.4	4.4
10. Do you believe that there is too much improvisation in Spain regarding energy? Yes--No.	71.4	19.6	9.0
11. Do you think it proper for the government to be both judge and party in applications for peaceful uses of nuclear energy? Yes--No.	51.4	42.4	6.2
12. Do you believe that you are sufficiently informed on nuclear energy? Yes--No.	15.0	83.4	1.6
13. Do you think that the press handles nuclear energy subjects with too much sensationalism? Yes--No.	75.4	19.6	5.0
14. Do you believe that information on nuclear matter appearing in the media requires more scientific rigor? Yes--No.	88.8	9.0	2.2
15. If a referendum were to be held in Spain on the construction of nuclear power plants, how would you vote? Yes--No.	53.6	34.0	12.4

Please, indicate your career field and your college major. Thank you.

Note: The numbers indicate, in percent, the affirmative and negative responses and the rest can be called abstentions. In the case of question 7, the "yes" answer was given by those who had given a valid answer to the meaning of TMI-2 in the context of nuclear energy. The low percentage shown is a good indication of the confusion aroused by the question. Some replied: "I kill you defenseless in 2 minutes"; "maximum irradiation time--scale 2."

3.2. Universe and Sample

To make sure that the above-mentioned survey would be a good estimate of university opinion, we had to meet one essential requirement: the sample surveyed would have to be representative of the total population, consisting of 200,000 students in Madrid. (We must say however that among those 200,000, not even one out of every four is in a real university environment since that figure includes students living off campus and matriculated individuals who never show up in the lecture halls.)

The representative nature of this sample was based above all on the careers. It is clear of course that the general attitude of a philosopher is very different from that of an engineer, especially during his college days, and we assumed, with good reason, a posteriori, that the particular activity with respect to nuclear energy would also be very different.

Unfortunately but luckily the sample obtained does not faithfully reproduce the universe, nor is it very disparate, as we can see in the following table.

In the sample, careers in health (medicine, etc.) are overrepresented while those in economics, politics, and business management are underrepresented. Careers in teaching and journalism are also small in number, although this is compensated by careers in philosophy, literature, and law.

If you realize that about 70 students were used as interviewers, you will understand why there could be no more concordance in this. Nevertheless, this was a guarantee for randomness which is indispensable to make the survey basically reliable. We furthermore thought that half of those interviewed lived on campus while the other half lived in Madrid.

3.3. Results

Table III shows the 15 questions in the final form, together with the results obtained, expressed in percentages of our the 500 questionaires received.

Table III. Makeup of Universe and Sample

Career	% in sample	% in universe (*)
Medicine	11.4	8.39
Biology and veterinary science	7.6	3.90
Pharmacy	8.6	5.05
Philosophy and literature	18.4	14.30
Law	12.0	9.82
Economics and political science	7.2	15.73
Sciences	7.0	9.53
Engineering (excluding industrial engineering)	12.0	13.06
Industrial engineering	3.2	3.40
Architecture	4.4	5.72
Teaching	2.6	5.05
Journalism	2.6	6.05
No response	3.0	—

(*) Source: "Estadistica de la ensenanza en Espana," INE, Madrid, 1976.

To pin down the meaning of this number of interview subjects and without going into any mathematical details, we can say that this survey has a degree of confidence of 95 percent, with a margin of error of ± 4.5 percent. In reality, this comment requires the accomplishment of the hypotheses performed in the theory of statistics: randomness of sample selection, estimator not slanted [skewed], and other assumptions which make the evaluation given here questionable. At any rate it can serve as general guideline except for one fact: those who did not respond. For the above to be correct, the universe would have to be binomial, in other words, there would have had to be only two choices for each question: yes or no. A large percentage of abstentions logically would invalidate the survey since would not reflect anything other than the fact that a large portion of the population is undecided. But that is a finding that should not be ignored either.

Following these minor observations, the main body of this article will be concerned with a review of the results. The statistics speak eloquently even though they are not as terribly cold and aseptic as some statistics supporters claim.

It is obvious on the other hand that many of the questions in the survey are interrelated which is why it seemed a good idea to analyze the cross-over or correlations between answers given to similar equations. Tables 4 to 14 show these cross-overs which we will refer to later.

CUADRO IV

Cruce entre preguntas 1 y 15

15 1	SI	NO	A	Total 1
SI	30,8	2,0	2,8	35,6
NO	21,4	31,8	8,8	62,0
A	1,4	0,2	0,8	2,4
Total 15	53,6	34,0	12,4	100,0

Table IV. Correlation between Questions 1 and 15.

CUADRO V

Cruce entre preguntas 2 y 15

15 2	SI	NO	A	Total 2
SI	25,8	30,6	7,2	63,6
NO	27,8	3,2	4,4	35,4
A	0	0,2	0,8	1
Total 15	53,6	34,0	12,4	100,0

Table V. Correlation between Questions 2 and 15.

CUADRO VI

Cruce entre preguntas 3 y 15

15 3	SI	NO	A	Total 3
SI	40,0	26,4	8,4	74,8
NO	12,0	4,8	2,4	19,2
A	1,6	2,8	1,6	6,0
Total 15	53,6	34,0	12,4	100,0

Table VI. Correlation between Questions 3 and 15.

CUADRO VII

Cruce entre preguntas 4 y 15

15 4	SI	NO	A	Total 4
SI	40,2	6,0	6,0	52,2
NO	12,4	26,6	5,8	44,8
A	1,0	1,4	0,6	3,0
Total 15	53,6	34,0	12,4	100,0

Table VII. Correlation between Questions 4 and 15.

CUADRO VIII

Cruce entre preguntas 12 y 15

15 12	SI	NO	A	Total 12
SI	9,8	4,8	0,4	15,0
NO	42,8	28,6	12,0	83,4
A	1,0	0,6	0	1,6
Total 15	53,6	34,0	12,4	100,0

Table VIII. Correlation between Questions 12 and 15.

Key: SI--Yes; NO--No; A--Undecided.

CUADRO IX

Cruce entre preguntas 3 y 8

3 8	SI	NO	A	Total 8
SI	23,4	7,0	2,2	32,6
NO	47,2	11,4	3,2	61,8
A	4,2	0,8	0,6	5,6
Total 3	74,8	19,2	6,0	100,0

Table IX. Correlation between Questions 3 and 8.

CUADRO X

Cruce entre preguntas 3 y 11

3 11	SI	NO	A	Total 11
SI	42,4	7,0	2,0	51,4
NO	28,8	11,2	2,4	42,4
A	3,6	1,0	1,6	6,2
Total 3	74,8	19,2	6,0	100,0

Table X. Correlation between Questions 3 and 11.

CUADRO XI

Cruce entre preguntas 4 y 6

4 6	SI	NO	A	Total 6
SI	18,0	7,0	0,2	25,2
NO	31,0	33,6	2,0	66,6
A	3,2	4,2	0,8	8,2
Total 4	52,2	44,8	3,0	100,0

Table XI. Correlation between Questions 4 and 6.

CUADRO XII

Cruce entre preguntas 1 y 8

8 1	SI	NO	A	Total
SI	6,0	28,8	0,8	35,6
NO	26,0	31,6	4,4	62,0
A	0,6	1,4	0,4	2,4
Total 8	32,6	61,8	5,6	100,0

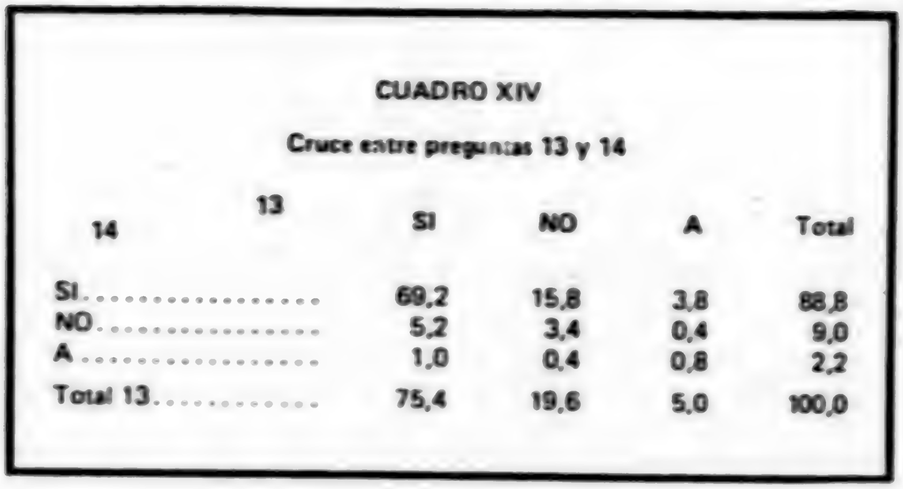
Table XII. Correlation between Questions 1 and 8.

CUADRO XIII

Cruce entre preguntas 8 y 9

8 9	SI	NO	A	Total
SI	20,4	3,2	0,6	24,2
NO	11,2	58,0	2,2	71,4
A	1,0	0,6	2,8	4,4
Total 8	32,6	61,8	5,6	100,0

Table XIII. Correlation between Questions 8 and 9. Key: SI--Yes; NO--No; A--Undecided.



CUADRO XIV

Cruce entre preguntas 13 y 14

14 \ 13	SI	NO	A	Total
SI	69,2	15,8	3,8	88,8
NO	5,2	3,4	0,4	9,0
A	1,0	0,4	0,8	2,2
Total 13	75,4	19,6	5,0	100,0

Table XIV. Correlation between Questions 13 and 14.
Key: SI--Yes; NO--No; A--Undecided.

3.3.1. Are the Answers Surprising?

Undoubtedly, surprise is a subjective phenomenon which presupposes a prior conviction. Perhaps, after the digression in the first two sections of this article, the number of those who are surprised by these results will be smaller but the one thing that is certain is that, when the results were submitted to the Sixth Annual Meeting of the Spanish Nuclear Society, and even before, there were expressions of surprise when the results were shown to various members of the country's nuclear community.

There was a bias to the effect that the mass of university students was anti-nuclear and pro-socialist. This latter point was evidenced by the survey in the sense that 75 percent of the sample were in favor of the nationalization of nuclear power plants. (This coincides with the election--due to the student vote--of Professor Bustelo as president of the Complutense University, for example.)

However, the anti-nuclear bias turned out to be wrong, although we will go into this at the proper time. According to Question 15, the most important question in the form from many viewpoints, more than half of the university students would vote "yes" for nuclear energy in a referendum and only one-third would vote against.

But, on the other hand, what is significant here is the relatively high opposition to the conduct of a nuclear referendum since 35.4 percent did not consider it necessary. This disproves another one of the general beliefs according to which the desire to decide the future of nuclear energy through a referendum is a universal desire.

In spite of the overall preference for the nationalization of the nuclear power plants, only a little more than half of those questioned proved to be in favor of having the government be both judge and party in the promotion of peaceful uses of nuclear energy (Question 11), which is a partial but very marked contradiction.

The hostility of university students toward the idea of economic compensations due to living in the vicinity of a nuclear power plant (or a hydroelectric dam) is even more astonishing. Here we find that 62 percent of those surveyed would be against the idea of nuclear economic compensation but, oddly enough, 62 percent also replied that they would live near a power plant (Question 1). The correlations between these two questions will be considered at the proper moment.

Although it is not strictly a surprise, it is necessary to mention the opposition to the establishment of equivalences between the damaging effects of various causes (tobacco and radioactivity, Question 6). However, practically the same number of those who answered "yes" for a referendum believe that nuclear risks can be reduced so much that they would be negligible compared to the risks encountered in auto traffic.

Nor is it a surprise to find that the majority believes that they are insufficiently informed on nuclear energy. Likewise, it is felt that the press is entirely too sensationalist in dealing with this matter. The majority is just about overwhelming --almost 90 percent--in answering affirmatively to the belief that more scientific rigor is needed in information on nuclear energy.

3.3.2. Correlation between Questions

By evidencing the correlations between interrelated questions on any subject, we can improve our knowledge on the status of opinion and attitude motivating the responses that were obtained.

As we indicated earlier, tables IV to XIV show the correlations that appeared most interesting and in accordance with them we entertained the following considerations.

First of all, 40 percent of those who would vote "yes" in a nuclear referendum would not live less than 30 kilometers from a power plant; we believe this to be symptomatic of a certain fear of the unknown (nuclear power plants), overcome by another even more powerful fear (electric energy shortage).

The majority (75 percent) of those who believe that this referendum is unnecessary would vote "yes" in it.

A similar percentage (75 percent) of those who would vote "no" turned out to be in favor of the nationalization of nuclear power plants and we can see the same distribution among those who would vote "yes."

The belief that nuclear risks can reduced to a level lower than those connected with auto travel quite accurately determines the affirmative vote here; we also observe the opposite case with the majority of those who believe that those risks cannot be reduced, voting negatively.

But one-third of those who say they are in favor of nationalization contradict themselves by answering that the government should not be judge and party in this matter; this perhaps means that the view in favor of nationalization is partly emotional (and partly rational, of course).

The comparisons between tobacco and radioactivity are not accepted by the population and this can be a factor of orientation in nuclear information dissemination drives.

Half of those who do not think that economic compensation would be necessary however would not live near a power plant. The other half voted "yes"--and without compensation. Is this not a very altruistic, Quixotic, philanthropic, and rather immature, particularly college-type attitude?

Even those who believe that the press is not too sensationalist on nuclear topics do say that they are in favor (to the extent of 80 percent) of more scientific rigor in the treatment of these subjects in the media.

3.3.3. Consistency in Survey

The only objective way to find out what people are thinking is to ask them and this is what we do in a survey, except that we do it with a selected sample, not with the entire population.

In spite of this, opinion surveys do not have much credibility in some circles whose members argue that public opinion is essentially changeable and capable of being influenced and that people do not respond equally to a hypothetical referendum, on the one hand, and to a real referendum, on the other hand, with the attendant election boards, the atmosphere of seriousness, and propaganda.

It would be idle and irrelevant to discuss this topic in this article but we must somehow defend the coherence and consistency of what our survey reflected.

First of all, as we said before, the choice of interview subjects was based on chance and, although the sample does not exactly reproduce the spectrum of university career fields, it is rather close and it is very balanced.

Second, we have been able to find that surprises over certain responses were not as great and that some of them (such as nationalization) are tied to other university opinions and beliefs.

To underscore the consistency of our results, we want to add a section showing the responses to question 15 (yes or no on the referendum) classified according to career field. We can see that coherence does exist.

3.3.4. Tendencies by Career Fields

Table XV shows the above-mentioned results, with career fields grouped by related factors, to make sure that the subgroup questioned under each heading will be sufficiently large. In this respect it must be said that, in each group, the number of those questioned is 100, which means an error of less than ±10 percent with 95 percent degree of confidence. (The only exception is the group of sciences whose number did not come up to 50. Nevertheless, the results are very similar here to the general averages.)

Table XV. Answers to Question 15, according to Career Field (%)

Careers	Yes	No	Undecided
Medicine + pharmacy + veterinary science + biology	57.7	30.8	11.5
Philosophy and literature	28.4	55.7	15.9
Physical sciences, chemistry, mathematics	55.2	38.0	6.8
Engineering + architecture	68.9	19.9	11.2
Law + economics + business +	51.5	40.0	8.5

The literature and polytechnical career fields undoubtedly stand out for opposite reasons. The former constitutes the only group that shows a majority anti-nuclear attitude, together with a rather large degree of indecision (16 percent). The polytechnical students offer a really high percentage of "yes" answers, against some very small negative responses (20 percent). Between these two extremes, life sciences (medicine), physical sciences, and law and economics show figures very similar to those obtained as an average for the sample (Table III). Opposition on the nuclear issue increases in the order mentioned but we have majority pro-nuclear positions in three cases.

It is certainly logical that greater fear--the stronger negative attitude on the nuclear issue--is shown in career fields removed from the technological area. Both by training and by vocation, literature students are less inclined toward the view that nuclear energy is necessary and sufficiently safe.

We must also comment on the fact that the polytechnical students are the most pro-nuclear. Since the majority of individuals in the nuclear field must come from that environment (+ the sciences), it is justified and at the same time comforting by virtue of its coherence to find that they view the nuclear future in a positive light.

By way of anecdote--a point of secondary significance because of the small number of surveys--in the life sciences, the most pronuclear is pharmacy and the least (slightly anti-nuclear) is biology.

These tendencies, broken down by career fields, offer us a possibility of evaluating the nuclear opinion of university students in another way. Table III showed the percentage makeup of the population to which the sample was not strictly adjusted. Since we have the data in Table XV, we can average the response to Question 15 with the real makeup of the university population. If we put journalism and teaching or careers in literature together, we get the following figures:

Yes: 51 percent; No: 37.74 percent; undecided: 11.26 percent.

We can see that these figures coincide rather well with those in Table II, although they do express an opinion that is somewhat more antinuclear since there is a decline in the yes-responses of 2.6 percent and an increase in the no-responses of 3.74 percent; these are figures around the previously given error figure of ±4.5 percent corresponding to the analysis of the survey described. The fundamental cause of this variation is the fact that we likened the careers mentioned--which are underrepresented in the sample--to the literature career.

Since there is a wide variety of branches in the polytechnical career fields, not all of which are related to nuclear energy, it seems proper to clarify the particular spectrum of this group, especially because of its heavily pronuclear result.

Table XVI shows the percentages for the sample and the population.

Table XVI. Percentage of Polytechnical Careers

Career	% Population	% Sample
Architecture	29.68	22.8
Aeronautics	7.03	9.9
Agronomy	6.65	4.2
Communications and ports	12.46	19.8
Industrial	17.53	12.1
Mining	2.98	4.2
Forestry	4.00	8.4
Shipbuilding	3.78	3.5
Telecommunications	13.17	12.3
Information science	2.72	2.8

4. Conclusions

In line with the arguments introduced in the first few paragraphs of this article and basically in keeping with the results of the survey conducted in the universities of Madrid during 1980, there seems to be an attitude slightly in favor of nuclear energy in university circles.

Considering these circles to be very much inclined to challenge and opposition, this statement will undoubtedly be surprising due to a general prejudice which is already obsolete in spite of the fact that it belongs to very recent history.

Along with the results and the degree of confidence of the survey, which are eloquent by themselves, we have the fact that we can detect some phenomena today in Spanish universities (specifically in Madrid) which are difficult to compare to what university attitudes were 3 or 4 years ago.

It is possible that the decline in university political activism is tied in with the change we mentioned but we do believe that its real root is to be found in the economic crisis, as spelled out in the survey on the energy crisis. It might perhaps be a rather daring value judgment but one could say that skepticism regarding the future causes early maturity in students who realize their responsibility much earlier, even during the first few courses they take.

This was noted especially in the responses from the polytechnical students who to the extent of more than two-thirds proved to be in favor of the construction of new nuclear power plants.

It is very possible that the mental association of nuclear energy = progress has a deep hold among the vast student masses and we find precisely that literature students, who are less close to economic reality than humanist reality, are also less in favor of nuclear energy.

As an example of the coherence of the survey and its agreement with other expressions of university opinion manifested through votes, we must recall that the survey showed that 75 percent say they are in favor of nationalizing the nuclear power plants. Along with the contradiction mentioned earlier to the effect that only half of the sample believed it proper for the government to be both judge and party in this matter, we have the fact that this pro-socialist tendency toward nationalization agrees with the election of a socialist president for the Complutense University where there is a considerable degree of student participation.

Among the comments made on the results of the survey we might recall some because of their scope or significance. It is rather discouraging--especially to the media--that less than 2 percent of the university students came up with an acceptable answer to the abbreviation TMI-2.

It is rather odd that many of those who said that they would vote "yes" in a nuclear referendum and who are against economic compensations for living close to a power plant--it is rather odd, we repeat--that they answer that they would not live near a power plant. This gives the impression that nuclear energy is considered a lesser and necessary evil which one should not get too close to but which one must accept out of fear that electric stoves will someday be nothing but ornaments.

In our conclusions here we must not skip over the question that motivated the most unanimous response. We asked: do you believe that information on nuclear matters appearing in the media requires more scientific rigor? Well, 88.8 percent questioned answered "yes" and only 9 percent answered "no." Many persons were astonished by this massive attitude in favor of scientific rigor, even those in a university environment.

Perhaps there may be somebody who might argue that this attitude is wrong since it is impossible for the public at large to assimilate truly scientific explanations. But could this answer not also be interpreted as a charge against people active in the nuclear field to the effect that they are not very good at correctly communicating their knowledge and pronuclear views and that they are rather ineffective in handling these matters with the media? Be that as it may, there seems to be a thirst for knowledge on the atomic nucleus and its energy possiblities. It would very probably be a good idea for us quickly to quench that thirst.

Finally, we must point out that, using the forms we got back from the interview subjects, we prepared two estimates as to how the university students would vote in a referendum on the construction of new nuclear power plants. The rough estimate comes to 53.6 percent yes-responses and 34.0 percent no-responses. Making a breakdown by career fields and weighting the partial results with the percentage of career fields in the total university population, we got an estimated 51 percent yes-responses and 37.74 percent no-responses. Since the undecided responses were not excessive (12.4 [percent] real or correlated, corresponding to 11.26 percent of the total) we could conclude this effort here by revealing university opinion on nuclear energy, saying the public expects this energy source to be capable of demonstrating what everybody wants so much: that is to use to solve the perennial crisis we find ourselves in.

Acknowledgments

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